REMARKS

Claims 12-21 are pending.

Claims 12-21 are rejected.

Claims 12 and 15 are amended.

Amended Claims 12 and 15

Applicants have amended claims 12 and 15 to specify the anionic monomer of the water soluble anionic polymer. Support for the amendment may be found on page 5, second paragraph.
No new matter has been added.

Copending Applications/Terminal Disclaimer

The Examiner is aware of US 6,288,010 by the same inventor. **The Applicants have previously submitted a terminal disclaimer over this granted patent. See file wrapper and Terminal Disclaimer submitted on August 13, 2003.** The Applicants are unaware of any other copending US applications which are "material to patentability" of the application in question.
Thus this rejection has previously been overcome.

Present Invention

At this point in the prosecution, the Applicants believe that the Examiner will benefit from very short background description describing the distinguishing features embodied by the invention.

Fertilizer solutions are generally supplied by the manufacturer as an aqueous concentrate in large batches. The solutions contain high concentrations, often 10 to 80 wt. % (dry solids) of dissolved inorganic fertilizer. It is usual to dose the concentrated fertilizer solution into irrigation water so that the solution is diluted and the fertilizer is applied to the soil during irrigation. Thus irrigation equipment accommodates concentrated fertilizer solutions. See second paragraph of page 1 of the disclosure.

Anionic polymers in soil stabilization is known. Anionic polymers tend to form viscous aqueous solutions unless used at low concentrations. See page 1, paragraph 3.

It would be an advantage to combine the highly concentrated fertilizer solutions and anionic polymers using the same equipment used for dosing the concentrated fertilizer solutions into irrigation water.

However, if most anionic polymers were to be included in a solution with the concentrated aqueous solution of fertilizer, the amount of polymer required to give an appropriate concentration on the soil (after dilution to the degree required for the fertilizer) would by high. This would normally produce a very viscous solution which could not be processed in the same apparatus as standard fertilizer solution. See first paragraph, page 2.

In the past, normal practice has been to dose separately the concentrated fertilizer solution and anionic polymer solution to the irrigation water. See page 2, first paragraph.

Until now it has not been possible to combine both the concentrated fertilizer solution (at least 10 wt. % solids) and an anionic polymer at sufficient concentration, so as to avoid the need for separate addition points, but to be able to use dosing equipment currently in place for irrigation systems, in particular equipment in place for processing fertilizer solution.

The combination is only possible with particular anionic polymers. The specific anionic polymer is detailed in present claims 12 and 15. The soil treatment process or method for production of the aqueous soil treatment composition requires a very specific anionic polymer (9 to 12 dl/g, formed from 60 to 80 anionic monomer and 40 to 20 wt. % nonionic monomer), wherein the anionic polymer is formed from at least one anionic monomer selected from the group consisting of ethylenically unsaturated carboxylic acids, ethylenically unsaturated sulfonic acids and salts thereof.

The inventors have discovered that certain anionic polymers can be added to 10 wt. % fertilizer solutions at relatively high concentrations (~2 wt. %) and exhibit surprisingly low viscosity. As the composition (particular anionic polymer + concentrated fertilizer solutions) exhibits low viscosity, the standard dosing equipment in place for concentrated fertilizer solutions may be used to dose the polymer and fertilizer simultaneously. Separate dosing of polymer and fertilizer solution is no longer required.

The prevention of excessive viscosity means that the defined polymers can even be added at the fertilizer plant without difficulty. See page 3, third paragraph.

35 USC 112, First Paragraph

Claims 12-21 are rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement.

Examiner states:

> "Applicant had no possession of the claimed subject matter at the time the application was filed. The data presented in the specification on pages 10-12 does not describe the invention as claimed. **The method steps as claimed are missing.** "

As to The statement the "Method Steps are Missing"

The Applicants refer the Examiner to page 3, lines 13-16. The invention provides a single pack product which gives both fertilization and soil stabilization. The anionic polymer is added to a standard concentrated solution of fertilizer (at least 10 wt. %) at a concentration sufficiently high to provide appropriate polymer concentration on the soil after dilution of the concentrated solution in the standard manner for fertilizer solutions.

The example 1 page 11 under Flocculation and Stabilisation demonstrates the **adding** of an aqueous soil treatment composition (anionic polymer and at least 10 wt. % fertilizer) **to water**. This test simulates irrigation water conditions. See page 10, lines 24-26. Thus the steps of adding the soil treatment composition to water is literally supported by the examples. The dilution of the soil treatment composition and actual irrigation of an area of soil is not exemplified but is simulated as explained and shown by the flocculation and stabilization results given in Tables 1-4. The results exemplified demonstrate the general usefulness of Polymer B, which gives low viscosity solutions with a range of ionic water-soluble fertilizers and simulated soil testing gives good flocculation and stabilization for a range of fertilizers. Thus the aqueous soil treatment compositions may be **added** to water, the composition being thereby diluted **and irrigating** an area of soil with the diluted composition.

The steps are thus supported by the examples and the disclosure.

Examiner goes on further to say that the step of

> "an ionic water-soluble fertilizer in an amount of at least 10 weight percent includes a large number of compounds having different molecular weight, different structures and different chemical properties. Furthermore, that the anionic polymer having an intrinsic viscosity of from 9-12 dl/g and formed from 60-80 % anionic monomer and from 40 to 20 % nonionic includes thousands of compounds.

Applicants respectfully submit that the data presented on pages 10-12 fully supports the present claim limitations, specifically in regard to the water-soluble ionic fertilizer and in regard to the specific anionic polymers claimed.

The Water-Soluble Ionic Fertilizer

The examples on the top of page 10, list **11 different water-soluble ionic fertilizers**. The water-soluble ionic fertilizers exemplified vary in content of urea, organic salts and organic matter (OM). There are representative examples of entirely inorganic such a KCL (0-0-10 or muriate of potash), urea/inorganic blends such as urea/ammonium nitrate(32-0-0) and blended fertilizers including blends with organic matter such as 14-2-10-2 + 2.5 % OM.

These water-soluble ionic fertilizers are combined with various anionic polymers. The fertilizer is present in at least 10 wt. %.

Thus the Applicants believe the listing and use of water-soluble ionic fertilizers with the various anionic polymers at the bottom of page 10 continued onto top of page 11, support a broad range of inorganic, urea-containing fertilizers and fertilizer containing organic mater. Support for a broad range of fertilizers may also be found at the bottom of page 5 and continuing through page 6, where specific exemplary ionic fertilizers are discussed in relation to specific anionic polymers.

Blend of Ionic Fertilizers with Anionic Polymers

The various water-soluble ionic fertilizers (at least 10 wt. %) in the present examples are blended with various anionic polymers at 2 wt. % in order to determine which anionic polymers blended well with different highly concentrated water-soluble ionic fertilizers solutions without forming a highly viscous product. See page 10, line 20.

It was found that **Polymer B (meeting the limitations of claim 12 and 15)** blended especially well with urea/ammonium nitrate and ammonium sulphate. See page 12, table 1. Furthermore, Polymer B preformed quite well with KCL, 18-08, 10-010, 10-10-10, 0-0-25-17S and 14-2-10-2 + 2.5%. See Table 3, page 16 and Table IV, page 17. **Thus there is clear support for the blend of ionic fertilizers from the primary classes of water soluble ionic fertilizers in combination with an anionic polymer meeting the present claim limitations.**

The obtained viscosities of the combination of fertilizer and anionic polymer mixtures can be found on page 17, Table 4 (those combinations with Polymer B).

The Examiner believes the presently claimed anionic polymer to encompass literally thousands of compounds. The Applicants have amended claims 12 and 15 to include only anionic polymers formed from at least one anionic monomer selected from the group consisting of ethylenically unsaturated carboxylic acids, ethylenically unsaturated sulfonic acids and salts thereof. This new amendment along with the existing limitations (9 to 12 dl/g, 60-80 anionic content and 40-20 nonionic content, water-solubility) significantly limits the claimed anionic polymers. Furthermore, when the anionic polymer is combined with the fertilizer, the composition cannot have a viscosity of not more than 4,000 cps further limiting the scope of the claims.

As the Examiner is aware, Applicants are entitled to more than what is exemplified. In the present case what is exemplified meets the very narrow anionic polymer claim limitation (almost in the middle of the said claim limitations). It would be unreasonable to limit the water-soluble ionic fertilizer to only those which are exemplified as this would allow others to unfairly profit from the present invention by slight changes in the composition of the ionic water-soluble fertilizer and anionic polymer.

Polymer B is formed from 65 wt. % acrylic acid and 35 wt. % acrylamide. The monomer compositions supports the present claim scope. The viscosity is 10 dl/g falling in the middle of the claim limitation for viscosity of 9 to 12 dl/g. When combined with concentrated fertilizer solution the viscosity is under 4,000 cps. See Table 1 on page 12.

For the above reasons, the Applicants believe that the present claim limitations regarding the water-soluble ionic fertilizer and anionic polymer are commensurate in scope with the claims and comply with the written description requirement.

35 USC 102(b)

Claims 12-21 are rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Hashimoto, US 3,798,938.

For the Examiner's information, Hashimoto was first cited by Applicant in the original IDS filed on October, 14, 1999. Thus Applicants have not relied on the present disclosure to inform the Examiner of related art but said art is listed on a PTO-1449 form.

US 3,798,838 describes a method of reducing the water permeability of soils by contacting them with an aqueous solution containing a water-soluble nutrient and a water-soluble partially hydrolysed polyacrylamide.

The solution of Hashimoto which is contacted with the soil may not contain more than 5 wt.% nutrient. See abstract and claim 1. The preferred amounts are much lower, for instance, not more than 1.15 wt. % in example 1 and 300 ppm of NH_4NO_3. Thus Hashimoto there is no overlap between Hashimoto and the present claim limitation of "at least 10 wt. % ionic water-soluble fertilizer.

Furthermore, Hashimoto only teaches addition of the polymer and nutrient **to the irrigation water**.

For example, Hashimoto teaches in column 4, lines 26- to 35 that:

> "The polymer can be **dissolved in ordinary irrigation water** by simple admixing of the polymer with the irrigation water or, preferably, the polymer is dissolved in an aqueous concentrate having a concentration form about 0.5 to about 2.0 weight percent to of the polymer and thereafter this concentrate can be blended **into the irrigation water** in a sufficient quantity to provide the aforementioned desired concentration of the polymer in the solution which is contacted with the surface soil."

The example 1 further backs up this analysis as the nutrient and polymer are added to the irrigation water. The two components are not mixed to provide a concentrated solution containing both components as presently claimed.

Thus the limitations of the present claims in regard to **wt. % of nutrient** and adding **a composition consisting essentially of the ionic water-soluble fertilizer in an amount of at least 10 weight percent and a water-soluble anionic polymer** having a viscosity of not more than 4,000 cps, to water and irrigating an area of soil with the diluted composition are not disclosed or suggested by Hashimoto. Therefore, the anticipation rejection is improper.

In regard to the 103(b) rejection over Hashimoto, the formation of a concentrated solution of 10 wt. % nutrient combined with the water-soluble anionic polymer cannot be obvious when Hashimoto specifically suggests **half the nutrient concentration** and addition of the two components to the irrigation waters, never remotely suggesting the formation of a concentrated solution of ionic fertilizer with anionic polymer.

Further, although Hashimoto suggests hydrolyzed polyacrylamide of anywhere from 5 to 80 %, the polyacrylamide used in the examples of Hashimoto have 20 to 30 % of its amide groups hydrolysed. Polymers of this type produce highly viscous solutions at polymer concentrations of 2 wt. %. This is shown in the present Table 2 found on page 14 of the disclosure. For examples, polymers F, G, A, Q and K all have anionic content below 40 wt. % and give high viscosity values. As a result, a solution of polymer of anionic content below 40 wt. % and nutrient at concentrations at least 10 wt. % cannot be processed in the same apparatus as standard fertilizer solution.

It is clear that Hashimoto never envisioned nutrient concentrations above 5 wt. %. It also clear that Hashimoto never envisioned combining the anionic polymer and ionic nutrient in a concentrated solution and irrigating an area of soil with the diluted composition.

Thus the Applicants respectfully believe the 103(a) rejection to be improper and overcome.

35 USC 103 (a)

Claims 12-21 is rejected under 35 USC 103(a) as being unpatentable over Miller, EP 0586,911 in view of Wallace, US 4,797,145 and Hashimoto, US 3,798,838.

Examiner states that EP '911 teaches a composition for treatment of soil containing anionic fertilizer and anionic polymer such as polyacrylamide from 97 to 0 mole % of different water soluble monomers and salts thereof.

Copolymers of acyrlamide and acrylic acid are specifically mentioned on page 3, line 41 of EP '911.

The compositions (nutrient and anionic polymer) is added to water prior to soil addition.

Examiner also states that Wallace, US '145 teaches aqueous compositions comprising a water soluble polymer and fertilizer salts.

It is unclear why the Examiner has combined Wallace and Miller unless perhaps to replace the gel compositions of Miller with the aqueous compositions of Wallace. Examiner makes no comments in this regard. But the Examiner does say that instant claims differ from the reference in claiming the

ranges of viscosities of the composition and that because the mole % of anionic monomer is suggested in EP '911, that the properties such as viscosity will be the same.

Miller suggests a copolymer or polymer made from about 3 to 100 mole percent of acrylic monomer units or salts thereof which overlaps with instant 60 to 80 wt. % anionic monomer limitation (page 3, line 39). Further that the compositions may further comprise an agricultural nutrient, generally from about 0.5 to about 60 wt. % also overlapping with the present claim limitation of at least 10 wt. % water-soluble ionic fertilizer. Additionally, Miller suggests molecular weight ranges from 20,000 to 20,000,000 for the polymer of his compositions. See claim 2. The polymer solutions and nutrient are combined before being diluted with a solution containing a redox catalyst which causes the polymer to gel while being applied to the ground surface. The general compositional scope of the nutrient and anionic polymers are described in Miller, but the general description of the anionic polymer would not lead one skilled in the art to select from the many anionic polymers encompassed by Miller to select a particular range of anionic polymers, that is 60 to 80 wt. % anionic content and combine with nutrient to form a composition and then further to dilute for irrigation. The examples of anionic polymers demonstrate only anionic polymers outside the scope of the present claims.

Additionally, Miller is directed to a gel grouting for soil stabilization. In contrast, the composition of the present invention is intended as a concentrate for use in irrigation. Thus it may contain any materials known for inclusion in such compositions. **It generally does not contain additional materials such as oxidizing agents, reducing agents, soil materials or seed materials. See page 6, second paragraph of present disclosure.** Applicants remind the examiner that the composition reads "consisting essentially of" which would exclude oxidizing or reducing agents. **This means the present claim limitations have no overlap at all with Miller. Thus Miller is an inappropriate primary reference. As such it cannot be combined with Wallace and Hashimoto.**

Wallace suggests the use of polymers of acrylic acid and acrylamide (col. 3, line 31) as an agricultural polymer. There is no particular suggestion to select a range of particular anionic content of polymer nor is there any mention of molecular weight or intrinsic viscosity of the agricultural polymer. Fertilizer salts may be incorporated together with the agricultural polymers in the irrigation water. See col. 6, lines 39-42. The weight % of fertilizer salts which can be used are from 5 % to 300 % of the agricultural polymer. Wallace only suggests the addition of fertilizer salts and agricultural polymer to the irrigation water.

Examiner combines all three references to make obvious all of the present claim limitations. The Applicants disagree that the combination makes obvious the present claims for the following reasons.

First of all, there is absolutely no suggestion in any of the references cited by the Examiner to select a polymer of anionic content ranging from 60 to 80 wt. % in combination with at least 10 wt. % ionic fertilizer to form an aqueous soil treatment composition. Miller suggests very broad ranges of possible anionic content which encompass the present claims but do not provide any motivation to select a specific anionic content range as presently claimed. Wallace is just as vague as to the specific make-up of his agricultural polymers. Hashimoto teaches a very wide range of hydrolysed polyacrylamide from 5 to 80 percent of its amide groups hydrolyzed. Further, Hashimoto teaches 12 to 45 percent of the amide groups might be hydrolyzed, col 3, lines 1-6. But none of these references teach or would direct one skilled in the art to select the particular range of 60 to 80 wt. % anionic content in the polymer. As explained in the present application, polymers within this range show considerable lower viscosity when combined with fertilizer concentrates.

Secondly, Miller is not a good primary reference because the compositions are used for grouting not irrigation. Note the Applicant claims an irrigation step. No such step is suggested by Miller. Also, the grouting compositions of Miller contain oxidizing and reducing agents in order to gel the compositions. These components are simply not appropriate for use in irrigation. The present claims read consisting essentially of which excludes additional components such as oxidizing and reducing agents. See page 8, paragraph 2. Thus there is no overlap between Miller and the present application claims. Without Millller, the combination of references (Wallace and Hashimoto) only suggest the addition of polymer and fertilizer to the irrigation water. Neither suggest adding a one pack compositions consisting essentially of concentrated fertilizer and anionic polymer to water and then irrigation with the diluted composition. Both Wallace and Hashimoto are clear in teaching only addition to the irrigation water directly. There is no suggestion to form a pre-concentrate. As Wallace suggests only the addition of fertilizer to irrigation water, his broad suggestion to add amounts of the fertilizer salts from 5 to 300 wt. % of the agricultural polymer does not apply to a concentrated fertilizer and anionic polymer but the ratio of polymer to fertilizer in the irrigation water. Thus Wallace does not suggest compositions comprising 10 wt. % of ionic fertilizer with anionic polymer. And as explained above Hashimoto never suggests more than 5 wt. % fertilizer concentrations.

Thus the combination of Miller with Wallace and Hashimoto fails to suggest the limitations of the present claims.

Additionally the results obtained by the specific combination of anionic polymer of IV 9 to 12 dl/g and at least 10 wt. % ionic nutrient, wherein the composition has a viscosity not more than 4,000 cps, allows application in irrigation systems in place for dispensing fertilization solutions, an unobvious advantage not contemplated by Miller and Wallace and Hashimoto as Miller is directed to grouting (compositions not appropriate for irrigating) and Wallace and Hashimoto never contemplated adding their individual components to anything other than the irrigation waters.

Reconsideration is requested in light of the arguments *supra*. Reconsideration and withdrawal of the rejection of claims 12-21 is respectfully solicited in light of the remarks *supra*.

Since there are no other grounds of objection or rejection, passage of this application to issue with claims 12-21 is earnestly solicited.

Applicants submit that the present application is in condition for allowance. In the event that minor amendments will further prosecution, Applicants request that the examiner contact the undersigned representative.

Respectfully submitted,

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